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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/617,433   | 07/11/2003  | Franz Prexl          | TI-34047            | 3238             |
| 23494  | 7590        | 09/28/2004           | EXAMINER            |                  |
| TEXAS INSTRUMENTS INCORPORATED<br>P O BOX 655474, M/S 3999<br>DALLAS, TX 75265 |             |                      | NGUYEN, MINH T      |                  |
|  |             |                      | ART UNIT            | PAPER NUMBER     |
|  |             |                      | 2816                |                  |

DATE MAILED: 09/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/617,433

**Applicant(s)**

PREXL ET AL.

**Examiner**

Minh Nguyen

**Art Unit**

2816

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8-10 is/are rejected.
- 7) ☒ Claim(s) 7 and 11-13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Specification*

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because it uses words which can be implied, i.e., "comprises", line 2. Correction is required. See MPEP § 608.01(b).

### *Claim Objections*

2. Claims 1, 5-6 and 8-11 are objected to because of the following informalities:

In claim 1, line 1, "comparator" should be changed to -- A comparator --,

line 6, "its main current path" should be changed to -- the main current path of said first transistor -- because the pronoun "its" can represent others such as M2 or M3 ...,

line 7, "circuited" should be changed to -- connected --.

In claim 5, line 3, "its" should be changed to -- the --,

line 4, "circuited" should be changed to -- connected --,

line 4, "path" should be changed to -- paths --.

In claim 6, same problems exist as discussed in claim 5.

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In claim 8, line 2, "path" should be changed to -- paths --.

In claim 9, line 3, "the other transistor" should be changed to -- other transistor --.

In claim 10, same problems exist as discussed in claim 1.

In claim 11, line 3, "and connected to" should be changed to -- and the output of the rectifier is connected to -- to avoid unclear problem,

line 4, "C(2)" should be changed to -- C(3) --.

Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,656,957, issued to Marlow et al.

As per claim 1, Marlow discloses a comparator with hysteresis (Fig. 5, see the title) comprising a first transistor (MINN) whose gate forms one input (INN) of the comparator and a second transistor (MINP) whose gate forms the other input (INP) of the comparator, the main current paths of both transistors (MINN, MINP) being connected to each other at one end (COM\_S), characterized by a third transistor (MINN2) and a fourth transistor (MINN3) being provided, the gate of said third transistor (MINN2) being connected to the gate of said first transistor (both gates receives INN signal) and its main current path being connected between the

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one end (COM\_S) of the main current paths of said first and second transistor (MINN, MINP) and connected via the main current path of said fourth transistor (MINN3) to the other end of said main current path of said first transistor (MINN), and the gate of said fourth transistor (MINN3) being connected to the output signal or inverted output signal of said comparator (connected to the output node OUT).

As explicitly shown and described, Marlow discloses the main current path of the fourth transistor (MINN3) which is an NMOS transistor connected to one end of the main current path of the first transistor (MINN). The purpose of the fourth NMOS transistor (MINN3) is for creating hysteresis (column 4, lines 16-38).

Marlow does not explicitly disclose the fourth NMOS transistor (MINN3) can be replaced by a PMOS transistor so that the main current path of the fourth transistor is connected to one end of the main current path of the second transistor (MINP) as called for in the claim.

However, replacing an NMOS transistor by a PMOS transistor in a circuit and providing appropriate bias voltage for the PMOS transistor is seen as an obvious modification by a person skilled in the art.

The examiner takes Official Notice the fact that in an electronic circuit, replacing, arranging elements and/or connections for the purpose of reducing or eliminating electromagnetic interference problems (EMI) is a well-known practice.

It would have been obvious to one skilled in the art at the time of the invention was made to replace the NMOS transistors MINN3 and MINP3 in the Marlow's comparator by PMOS transistors and provide appropriate bias voltages which are connecting one end of the current path of the fourth transistor to the to one end of the main current path of the second transistor

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(MINP) and the one end of the current path of the other transistor to the to one end of the main current path of the first transistor (MINN). The motivation would be to allow rearranging of the connections (cross connections), and therefore, EMI problem can be reduced.

As per claim 2, Marlow teaches the MOSFET transistors can be replaced by bipolar transistors in column 3, line 63.

As per claim 3, as shown in Fig. 5, transistors are MOSFET transistors.

As per claim 4, Marlow discloses a comparator having the structure discussed in claim 3, he further explicitly discloses the hysteresis is controlled by the current flows through MINP3 and MINN3 (column 4, lines 33-37). Therefore, he clearly suggests that the majority of current would flow through the main differential circuit which comprises transistors MINN and MINP. Marlow does not explicitly disclose the width/length ratio of the first transistor (MINN) is larger than the width/length ratio of the third transistor (MINN2) as called for in the claim.

As well-known by a person skilled in the art, the larger the width/length ratio of a transistor, the more current will be allowed to flow through, however, the transistor would cost more.

It would have been obvious to one skilled in the art at the time of the invention was made to choose a transistor to built the third transistor in the Marlow's comparator to have the width/length ratio of the third transistor (MINN2) smaller than the width/length ratio of the first transistor (MINN). The motivation would be to reduce the cost.

As per claim 5, this claim is rejected for the reasons discussed in claim 1. The recited fifth and sixth transistors read on transistors MINP2 and MINP3.

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As per claim 6, this claim is rejected for the reasons discussed in claim 4. The recited fifth and sixth transistors read on transistors MINP2 and MINP3.

As per claim 8, the recited current source reads on transistor MP2.

As per claim 9, the recited other transistor reads on MP2 and the recited supply voltage is VCC.

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,496,549, issued to Crawford in view of US Patent No. 5,656,957, issued to Marlow et al.

Crawford discloses an ASK demodulator (Fig. 1, also see abstract) which includes a comparator 31 but he does not disclose the comparator is implemented using the structure recited in the claim.

Marlow discloses a comparator having hysteresis which comprises elements recited in the claim as discussed in claim 1 herein above. He further discloses his comparator has advantages of high gain and easily designed hysteresis (column 2, line 50).

It would have been obvious to one skilled in the art at the time of the invention was made to implement the comparator in the Crawford's demodulator using the structure taught by Marlow for the advantages explicitly disclosed by Marlow as discussed herein above.

***Allowable Subject Matter***

5. Claims 7 and 11-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Claim 7 is allowable because the prior art of record fails to disclose or suggest the inclusion of a sub-circuit for latching the output of the comparator.

Claims 11-13 are allowed because the prior art of record fails to disclose or suggest the inclusion of a rectifier, first and second voltage followers configured as recited in claim 11.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minh Nguyen whose telephone number is **571-272-1748**. The examiner can normally be reached on Monday, Tuesday, Thursday, Friday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Callahan can be reached on 571-272-1740. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



9/24/04

Minh Nguyen  
Primary Examiner  
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